Evaluating change in oral health after integrating dental information in the school and meeting dental needs of 4th& 6th standard students. A two year follow up study

PhD SYNOPSIS

Submitted to

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Guide

Introduction -

Oral health is an integral part of the general health. It can also be considered as the diagnostic mirror for general health. Oral cavity is an important portal for the entry of pathogenic microorganisms in the human body. Sir William Osler has rightly stressed the significance of the oral cavity as the 'mirror' of general health[1].

Proper oral hygiene attainment is the most excellent way to achieve the desired oral health. Biofilm and plaque formation are one of the major etiological factors for the two most common dental diseases affecting mankind i.e. dental caries and periodontal diseases; oral health is accomplished by adapting effective plaque control methods.

Given the extent of the problem, oral diseases are major public health problems. Their impact on individuals and communities, as a result of pain and suffering, impairment of function and reduced quality of life, is considerable. Moreover, traditional treatment of oral disease is extremely costly, the fourth most expensive disease to treat in most industrialized countries. In many low-income countries, if treatment were available, the costs of dental caries alone in children would exceed the total health care budget for children[2].

The development of an enhanced school program to include oral health education for pre-school children and parents includes School-Based Oral Health Programs (SBOHP) that are specifically designed to improve access to dental care by reducing barriers for all children. Typically, children with the most needs are the ones that are best served in SBOHP, but all children can benefit from the services provided by their school's program. The appropriate school oral health initiative focuses on oral self-care practices, effective use of fluoride, healthy lifestyles in

relation to diet and nutrition, personal hygiene and healthy environments related to the school and access to optimal sanitary facilities. Although the families of young children often have limited awareness of and engagement with oral health, young children tend to deliver to other family members those messages learnt in school[3].

Though there has been considerable improvement in the oral health of children in the last few decades, dental caries still remains as the most common disease of the teeth among children all over the globe[4]. In India, the prevalence of dental caries among children ranges from 33.7% - 90%[5]. Au contraire, it is a preventable disease and if one follows the preventive procedures in the early stages than caries can be controlled to a large extent. If left untreated it affects the quality of life and also is an economic burden to the parent. It is very important to target oral health education to the children since the lifestyle and hygiene practices once established at an early age can go a long way in spending rest of the life in a healthy way. Children who suffer from poor oral health are 12 times more likely to have more restricted-activity days, including missing school, than those who do not. Annually, more than 50 million hours are lost from school due to oral diseases[6]. Schools provide an important setting because they reach the children worldwide and through them they reach the school staff, families and community at large. Global school health initiative which was launched in 1995 aims to foster health promoting schools to improve the health of school children, school staff, parents and the community[7]. According to the WHO health promoting school framework, oral health education should be a part of all subjects in the school curriculum. It can be effectively incorporated in the school curriculum[8,9]. Integrated approaches with active participation promote sustainable changes in the behavior[10].

Despite the professional awareness on the subject, McDonald and Avery, pointed out that although most schools encourage health programs, very few provide the proper value to oral health educational interventions. The authors also highlighted that the programs in almost all schools are usually condensed and fail to consider several important aspects required to improve the oral health habits. Concerned with the questions above and the fact that no long-term oral health educational intervention had yet been developed in the schools curriculum. One of such school dental health education program developed integrating in school curriculum for long term benefits and meeting the needs of oral health for children[11].

Health promoting school concept of WHO is seldom implemented in Indian context. More so the pilot study results which was conducted to evaluate the oral health information in the school curriculum using the WHO HPS guidelines shows that there is negligible oral health related information in the standard text book[12]. There is a need to integrate the WHO HPS framework's recommendation on improving health literacy through curricular approach into the school curriculum development Boards.

Hence this study is aimed to design the contents of dental information to be integrated in the school curriculum and to evaluate the change in oral health following this intervention over a period of 2 years.

Aim & Objectives -

AIM -

To evaluate the change in oral health after integrating dental information in the school curriculum and meeting dental needs of 4^{th} and 6^{th} standard students from Pune.

OBJECTIVES –

1. To develop dental information material booklet to be introduced in the school curriculum.
2. To assess the dental status and oral hygiene status of the school children.
3. To evaluate change in knowledge, attitude and oral health behavior among the study participants.
4. To evaluate the change in dental and oral hygiene status pre and post intervention.
5. To compare the oral health knowledge, attitude and practice among children of different schools in both study and control group at baseline, 1 year and 2 years.
6. To compare the DMFT and OHI-S scores among children of different schools in both study and control group at baseline, 1 year and 2 years.

Material & Methods –

The study was conducted among the school children aged 9 and 13 years old according to a specific time schedule (Annexure I). The schools were selected from Pune city and its vicinity. Three different categories of schools were selected: Private schools, Public schools and the rural schools. Private schools were those which were situated in Pune city and run by a private organization a list of which was obtained from the office of Director of Secondary School Education. Public schools were those which were situated in Pune city but run by the Municipal Corporation list obtained from the PMC Education department. Rural schools were those which were situated in rural areas in and around Pune run by the government agencies list obtained from the Education department Zilla Parishad Pune. 12 schools from each category were approached for permission to conduct the study according to the accessibility and convenience of the investigator. 4 schools in each category who gave permission were selected. Out of these 4 schools from each category (total 12), 2 were selected from each category (total 6) by simple random sampling by lottery method. Thus the 2 schools from each category which fulfilled the inclusion criteria and which gave permission to conduct the study in the particular time frame out of 12 were finally selected and cluster random sampling was followed in those schools i.e all the children studying in Class 4 and Class 6 were included in the study. Randomization was done at school level and 1 school from each category was randomly allocated to the study and control group (Annexure II).

Considering the prevalence of dental caries of 58% in 12yr olds from previous studies[13] the sample size derived was 400 based on the formula for sample size selection.

Sample size (n) = $4pq/ l^2$

Where ; p = prevalence of disease under investigation

q = 1-p

l = allowable error (considered to be 5%)

n = 8*58*42/25

n = 390.

Inclusion criteria:

a. Schools situated in Pune city and its vicinity and who will give the permission.

b. The participants of the study will be those who have completed 9 and 11 years on their last birthday and whose class teacher/ Principal have given the written consent for their participation (Annexure III)

Exclusion criteria:

a. The schools already involved with any kind of school dental program.

b. The children who will migrate to other place outside Pune or will get transferred to other school during the 2 year study period.

c. The children who would be absent on the day of subsequent examinations at 1^{st} year & 2^{nd} year.

d. Any child who has not filled the complete questionnaire.

List of schools included in the study:

STUDY GROUP	Private school	S.V Union Highschool & Junior College, Pune
	Public school	Nehru Prathamik Vidyalaya & Gora Kumbhar Highschool, Pashan, Pune
	School from Rural set up	Zilla Parishad School, Lavale. Dist. Pune
CONTROL GROUP	Private school	St. Vincents School, Pune.
	Public school	Pune Municipal School 162B, Katraj, Pune
	School from Rural set up	Zilla Parishad School, Maan. Dist. Pune

Intervention:

Development of Dental Information booklet - The content of the Dental Information booklet included was based as per the WHO Health promoting school (HPS) framework. Based on the guiding principles of the Ottawa Charter for Health Promotion and the recommendations of WHO's Expert Committee on Comprehensive School Health Education and Promotion, the WHO Global School Health Initiative was launched in 1995[14]. The Initiative aims to foster health-promoting schools (HPSs); these are schools that constantly strengthen their capacity as a healthy setting for living, learning and working. In our study the booklet was adopted and developed according to the WHO Health Promoting Schools guidelines (HPS) 1995[14]. It covered topics related to anatomy and structure of teeth, hidden sugars, types of sweet, carious processes,

plaque & calculus, gingival inflammation, prevention of dental caries, deleterious oral habits like tongue thrusting, lip biting, thumb sucking, malaligned teeth, brushing techniques, importance of fluorides in prevention of dental caries and dental caries preventive treatments like pit & fissure sealants along with importance of balanced diet. This oral health education was conducted with the help of a flipchart in the classroom setting (Annexure IV).

Study group: The Oral health education (OHE) was given 4 times in a academic year for 30 minutes. The students were asked to fill the questionnaire at the start of the study & towards the end of the academic year in class 4^{th} 5^{th}, 6^{th} and 7^{th} standard. The oral examination was conducted at baseline & end of each academic year for a period of 2 years. A dental referral card was provided and asked the students to get the treatment done before the next dental examination. A single investigator conducted the Oral Health Education (OHE) and the Oral examination.

Control group: A health education session was conducted once in a year for 20 minutes and the oral examination was conducted at baseline & end of each academic year for a period of 2 years. A dental referral card was provided and asked the students to get the treatment done before the next dental examination. The same investigator conducted the Oral Health Education (OHE) and the Oral examination.

Evaluation - Evaluation was done twice, at the end of first and second year of school academics. Baseline data was also collected before the start of the intervention in both the groups. The outcome measures for evaluation were: DMFT, OHIS, change in knowledge, attitude and oral health behaviour

Survey instrument:

A structured self administered, close ended, pilot tested 14 & 21 item questionnaire was custom designed & was developed to evaluate the knowledge, attitude & practices of the study sample of std. 4^{th} & 6^{th} which was made available in English and the local language (Marathi) (AnnexureV).

In the first part of the questionnaire questions were designed to elicit the knowledge of the participants about dental caries and oral hygiene. A score of +1 was given to each correct answer and 0 for wrong answers or don't know. The correct answer was decided by the consensus of experts. Thus the total score ranged from 0-5 & 0-7 for std. 4^{th} & 6^{th} respectively.

The second part of the questionnaire (attitude) required the respondents to make a decision on the level of agreement with a statement based on a 4-point Likert scale (Very important, Slightly important, Slightly unimportant, Totally unimportant). Each participant had to choose one answer to one statement. Each answered statement was measured by giving the highest score of 3 to 'very important' responses which showed positive views, 2 to 'slightly important', 1 to 'slightly unimportant' and 0 to 'totally unimportant'. The total attitude score therefore ranged from 0-15 & 0-21 for std. 4^{th} & 6^{th} respectively.

For the behavior section each answered statement was measured by giving the highest score of 3 and lowest score of 0 for the most appropriate behavior and wrong behavior respectively. Scores of 2 and 1 ranged for appropriate behavior alternatives in descending order. The total attitude score therefore ranged from 0-12 & 0-21 for std. 4^{th} & 6^{th} respectively.

Content validation – Face validity was checked after discussion of the questionnaire items with a team of experts and their feedback was gained. All the questions were discussed and a consensus was arrived on the question to be incorporated in the questionnaire. The questionnaire was also checked for its content validity by subjecting it to pretesting and retesting.

Pretesting –

The aim at this stage was to check the wording, clarity as well as comprehensibility of theadapted questionnaire as it was custom made. This stage was also used to check wether respondents were interpreting the meaning of each item in an appropriate manner. A convenience sample of 20 children each from 4^{th} and 6^{th} std was selected and each one was given a copy of the questionnaire to complete after checking the face and content validity. Anyone having any difficulty in interpreting the meaning of any question, any terminology if not properly understood was asked about. Respondents were encouraged to elucidate their understanding of the terms in an open ended manner. Responses were recorded and accordingly changes were done in the questionnaire.

Reliability –

The pilot study was conducted on a random sample of 20 children each from std. 4^{th} and 6^{th}. The survey instrument (questionnaire) was pretested for reliability and the Cronbach's alpha values for internal consistency for knowledge, attitude and behavior were 0.71, 0.85, and 0.69 on the basis. Retesting of the questionnaire was done after a week, with care taken not to have the retest interval either too short or too long[15]. The pilot study participants filled the questionnaire again followed by an oral examination. Their responses were than correlated to previous ones by intraclass correlation coefficients. The mean values obtained were 0.90, 0.92 and 0.96 for

knowledge, attitude and behaviors respectively. Kappa statistics values of 0.93 showed excellent Intra-examiner reliability for clinical examination.

Clinical examination:

A single examiner completed the clinical examination. The examiner was calibrated and necessary ethical approval was obtained from the Institutional Ethics Committee. Assent of the participants was taken (Annexure VI). The oral examination was done to record the dental caries status (WHO 1997) [16] from which the dental caries experience (DMFT) was recorded and Oral hygiene status using OHI-S index by Greene and Vermilion 1964[17]. Examination was carried out in a room under good illumination. The American Dental Association type III clinical examination was carried out using mouth mirror, CPI probe and explorer (Annexure VII). Any questionnaire with incomplete data was excluded from the final analysis. Usage of the referral card provided was also checked in terms of total number of students who had undergone treatment for dental caries.

Examination and Oral Health Education was done over a period of upto 3 days in each school at baseline, 1 year and 2 years to include all the children who may be absent on the 1st day of examination. This was done in particular to take care of attrition of study subjects. Any child who was still found absent was excluded from the study. Any child who had left any portion of the questionnaire blank inadvertently was urged to fill in the same if he wished to so that he would not be excluded from the study.

Statistical analysis:

All the statistical analysis was performed using SPSS version 17 software. Descriptive statistics were used to assess the mean and SD of study variables. Unpaired t-test was employed to compare the study variables between study and control group. Repeated measure ANOVA followed by post-hoc Tukey test was employed to assess the change in scores of study variables at baseline, 1 year and 2 year within each group. Statistical significance was fixed at $p < 0.05$.

Results –

Table 1: Demographic details of study participants

		Study Group		Control	
		N	**%**	**N**	**%**
Age	9 years	75	21.1	103	28.1
	10 years	79	22.2	76	20.7
	11 years	141	39.6	126	34.3
	12 years	49	13.8	49	13.4
	13 years	12	3.4	13	3.5
Gender	Male	236	66.3	287	78.2
	Female	120	33.7	80	21.8
School	Private	168	47.2	179	48.8
	Public	104	29.2	104	28.3
	Rural	84	23.6	84	22.9
Standard	4^{th}	171	48.0	197	53.7
	6^{th}	185	52.0	17	46.3

Totally 723 children with mean age of 11.5 years participated in the study. No significant differences in age, gender, type of school and standard were observed between study and control group.

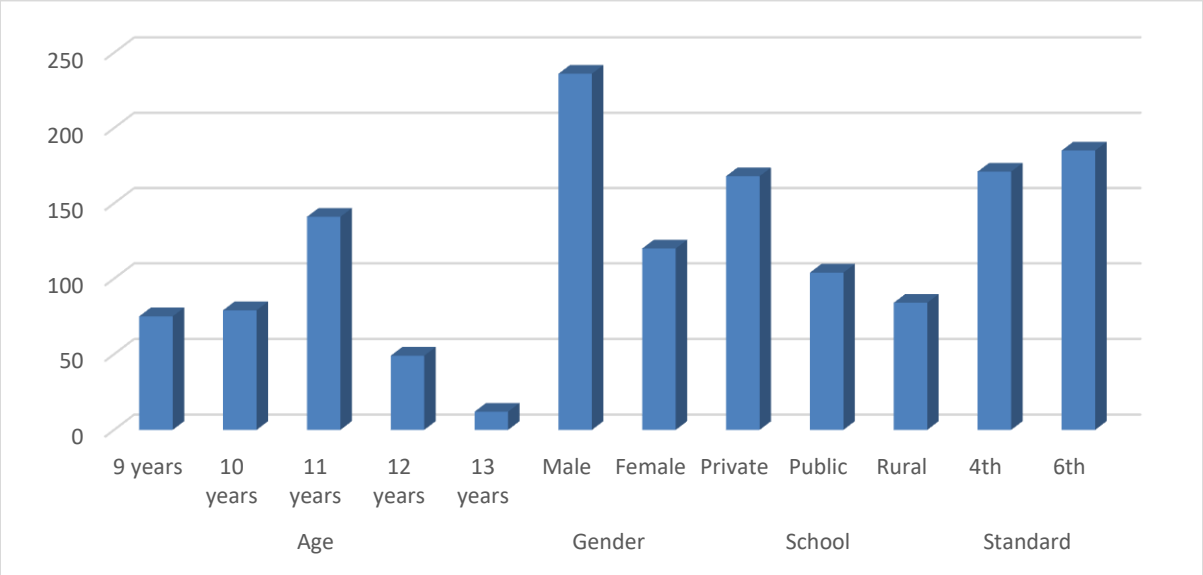


Table 2 – Knowledge, Attitude, Practice, DMFT and OHI-S scores of study participants of study and control groups.

Standard	N	Group	Attribute	Mean	SD
4	171	Study Group	Knowledge	1.98	.871
			Attitude	5.95	2.17
			Behavior	5.78	2.05
			DMFT	1.51	.863
			OHI-S	2.90	1.19
	197	Control Group	Knowledge	1.79	.776
			Attitude	5.42	2.07
			Behavior	5.39	2.05
			DMFT	1.23	.688
			OHI-S	2.91	1.14
6	185	Study Group	Knowledge	3.58	1.878
			Attitude	12.01	3.455
			Behavior	13.67	3.508
			DMFT	1.34	.949
			OHI-S	2.92	1.11

	170	Control Group	Knowledge	3.41	1.963
			Attitude	12.00	3.51
			Behavior	13.96	3.65
			DMFT	1.82	1.13
			OHI-S	2.94	1.08

The knowledge, attitude and practice score of 4th std study population was 1.98, 5.95 and 5.78, respectively. With 6th std it was 3.58, 12.01 & 13.67 respectively. Mean DMFT and OHI-S score of 4th std was 1.51and 2.9 respectively in study group and 1.34 and 2.92 in 6th std students. There was no substantial difference in knowledge, attitude, practice, DMFT and OHI-S between study and control group.

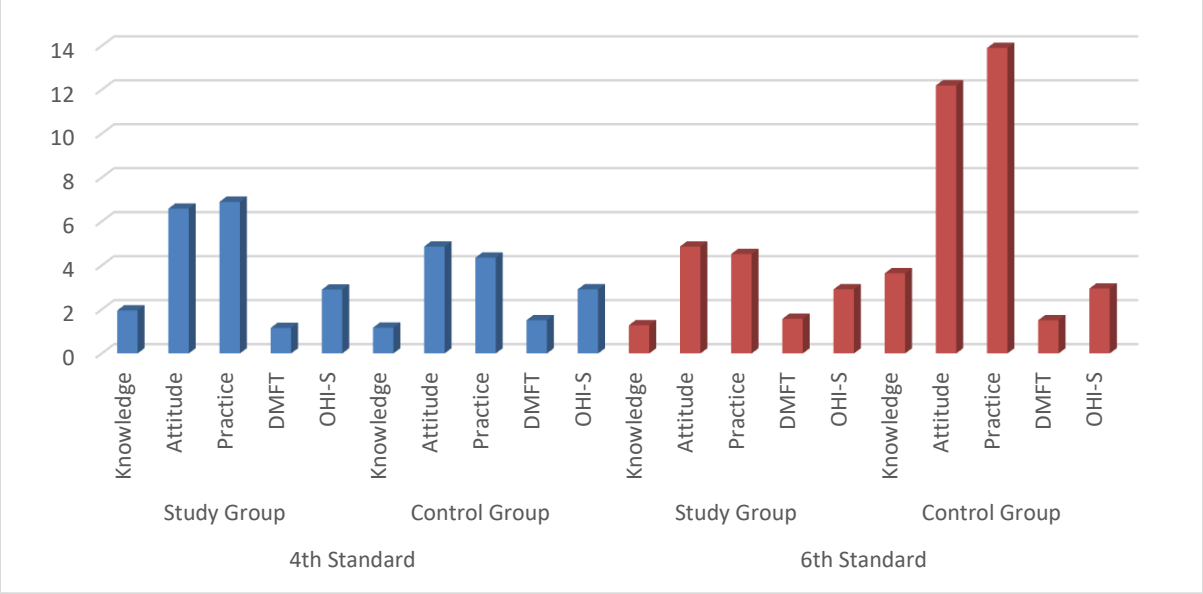


Table 3 - **Knowledge, Attitude, Practice, DMFT and OHI-S scores of study participants of various schools**.

Standard	N	School	Attribute	Mean	SD
4	171	Private	Knowledge	1.95	0.81
			Attitude	6.58	2.14
			Behavior	6.89	1.82
			DMFT	1.16	0.79
			OHI-S	2.90	1.16
	118	Public	Knowledge	1.17	0.79
			Attitude	4.86	1.62
			Behavior	4.35	1.40
			DMFT	1.51	0.73
			OHI-S	2.91	1.16
	79	Rural School	Knowledge	1.28	0.91
			Attitude	4.86	2.00
			Behavior	4.52	1.6
			DMFT	1.57	0.74
			OHI-S	2.91	1.17
6	176	Private	Knowledge	3.64	2.02
			Attitude	12.19	3.86

			Behavior	13.90	3.68
			DMFT	1.51	1.13
			OHI-S	2.95	1.09
	90	Public	Knowledge	3.44	1.96
			Attitude	11.87	3.14
			Behavior	13.57	3.61
			DMFT	1.66	1.00
			OHI-S	2.89	1.08
	89	Rural School	Knowledge	3.27	1.62
			Attitude	11.76	2.98
			Behavior	13.48	3.34
			DMFT	1.60	0.99
			OHI-S	2.95	1.12

In 4^{th} std students about 46% children were from private schools, 32% from public and 22% from rural schools. In 6^{th} std students about 49% children were from private schools, 25% from public and 25% from rural schools.

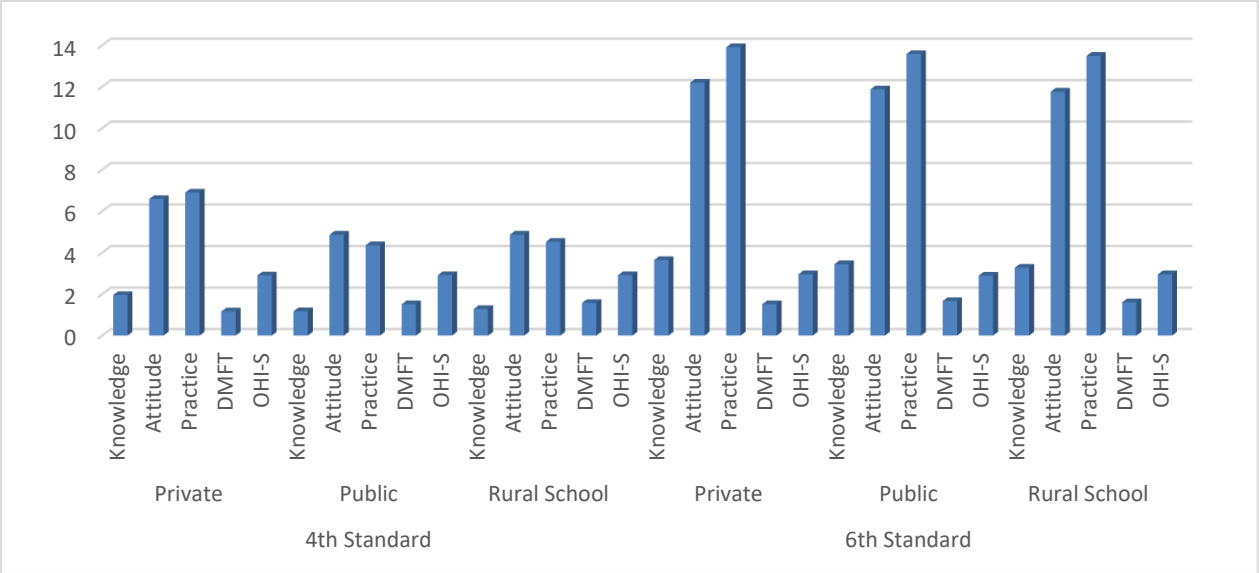

14
12
10
8
6
4
2
0
Knowledge
Attitude
Practice
DMFT
OHI-S
Private
Public
Rural School
4th Standard
6th Standard

Table 4 – Within group comparison of Knowledge in study and control group in 4th& 6th standards at different intervals of baseline, 1 year & 2 years.

Group	Std	Interval	Mean	SD	N	F	p value	Post hoc Comparison	p value
Study Group	4	0	1.98	.87	171	4189.0	**0.001**	0 vs 1	**0.001**
		1	3.19	.82				0 vs 2	
		2	4.62	.48				1 vs 2	
	6	0	3.58	1.87	185	2666.2	**0.001**	0 vs 1	**0.001**
		1	4.99	1.57				0 vs 2	
		2	6.34	.66				1 vs 2	
Control Group	4	0	1.19	.77	197	734.4	**0.001**	0 vs 1	**0.001**
		1	1.76	.88				0 vs 2	
		2	1.90	.95				1 vs 2	
	6	0	3.41	1.96	170	1052.7	**0.001**	0 vs 1	**0.001**
		1	3.73	1.60				0 vs 2	
		2	4.38	1.18				1 vs 2	

Intervals: 0 - Baseline; **1** – 1 year; **2** – 2 year; Statistically significant with p value ≤ 0.05

Knowledge scores showed overall statistically significant difference when compared within group at different time intervals for both study group and control group for 4th & 6th stds. In both study and control group knowledge of oral health at 1 year and 2 year showed statistically

significantly higher scores compared to baseline. Knowledge level at 2 years is significantly greater than 1 year in both groups in 4^{th} & 6^{th} stds.

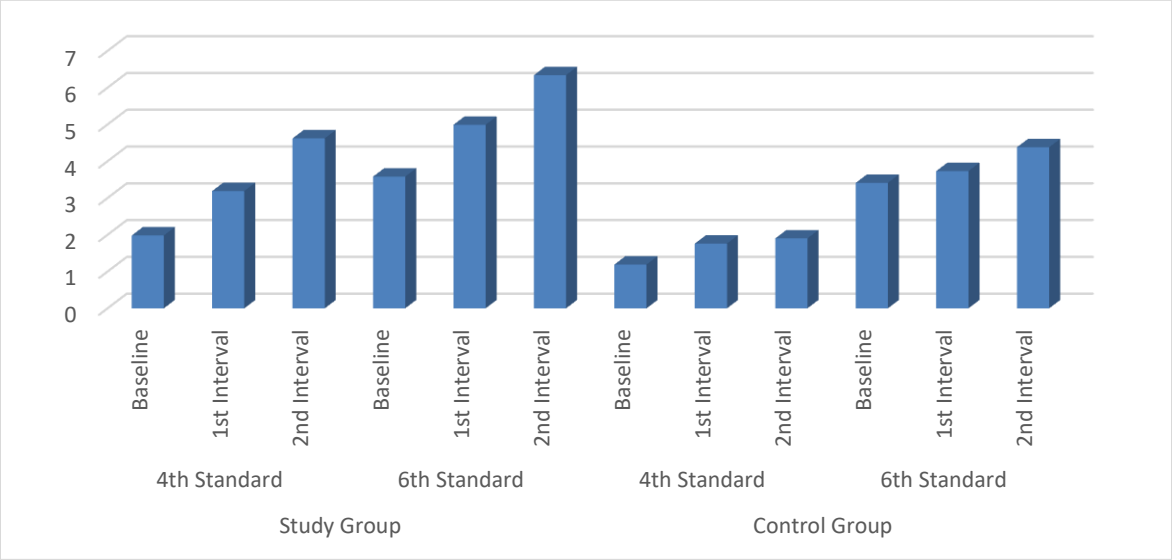


Table 5 – Within group comparison of Attitude in study and control group in 4th& 6th standards at different intervals of baseline, 1 year & 2 years.

Group	Std	Interval	Mean	SD	N	F	p value	Post hoc Comparison	p value
Study Group	4	0	5.95	2.17	171	4833.2	**0.001**	0 vs 1	**0.001**
		1	8.41	2.25				0 vs 2	
		2	13.26	1.61				1 vs 2	
	6	0	12.01	3.45	185	6588.7	**0.001**	0 vs 1	**0.001**
		1	15.73	3.12				0 vs 2	
		2	18.97	2.04				1 vs 2	
Control Group	4	0	5.42	2.07	197	1416.1	**0.001**	0 vs 1	**0.001**
		1	6.37	2.33				0 vs 2	
		2	6.85	2.61				1 vs 2	
	6	0	12.00	3.51	170	3274.7	**0.001**	0 vs 1	**0.001**
		1	12.46	2.83				0 vs 2	
		2	13.39	2.63				1 vs 2	

Intervals: 0 - Baseline; **1** – 1 year; **2** – 2 year; Statistically significant with p value ≤ 0.05

Repeated measure ANOVA test showed overall statistically significant difference in attitude scores when compared within group at different intervals for both study and control group in 4th & 6th stds. Post hoc comparison in both study and control group revealed statistically significantly higher attitude at 1 year and 2 year compared to baseline. Attitude scores at 2 years is significantly greater than 1 year in both groups for 4th & 6th stds.

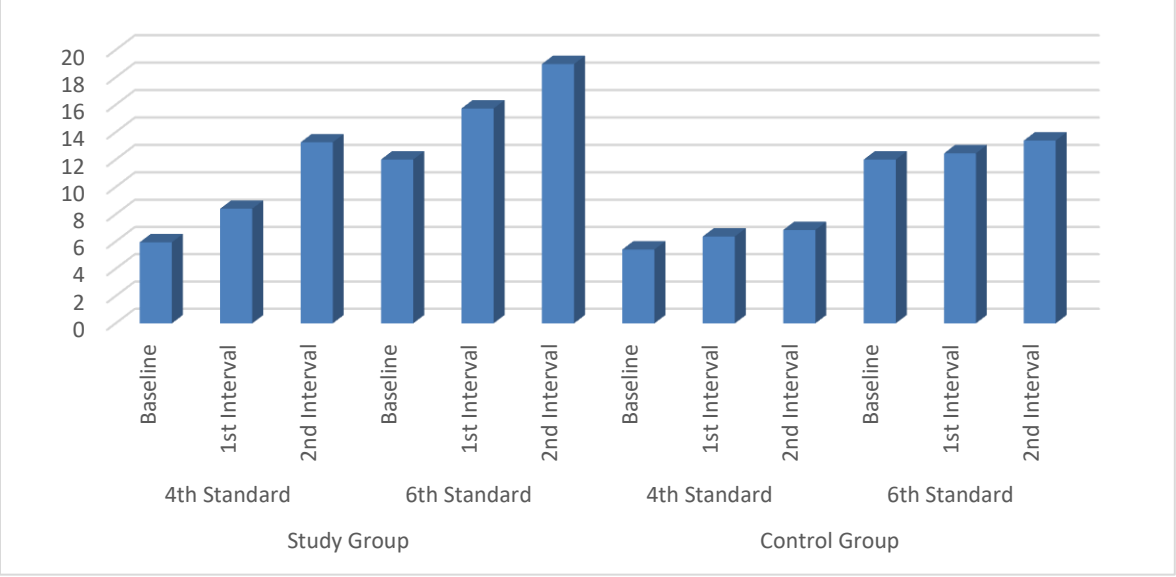


Table 6– Within group comparison of Behavior in study and control group in 4th& 6th standards at different intervals of baseline, 1 year & 2 years.

Group	Std	Interval	Mean	SD	N	F	p value	Post hoc Comparison	p value
Study Group	4	0	5.78	2.054	171	5959.9	**0.001**	0 vs 1	**0.001**
		1	9.11	2.261				0 vs 2	
		2	10.82	.978				1 vs 2	
	6	0	13.67	3.508	185	11113	**0.001**	0 vs 1	**0.001**
		1	17.75	2.505				0 vs 2	
		2	19.82	1.420				1 vs 2	
Control Group	4	0	5.39	2.059	197	2199.6	**0.001**	0 vs 1	**0.001**
		1	6.62	2.416				0 vs 2	
		2	7.31	1.601				1 vs 2	
	6	0	13.76	3.658	170	4026.5	**0.001**	0 vs 1	0.667
		1	13.83	3.278				0 vs 2	**0.001**
		2	15.36	2.400				1 vs 2	**0.001**

Intervals: 0 - Baseline; **1** – 1 year; **2** – 2 year; Statistically significant with p value ≤ 0.05

Within group comparison at different intervals using repeated measure ANOVA test showed overall statistically significant difference in behavior scores for both study and control group of 4^{th} & 6^{th} std. Pairwise comparison in both study and control group of 4^{th} std and study group of 6^{th} std revealed statistically significantly higher practice scores at 1 year and 2 year compared to baseline. Behavior scores at 2 years is significantly greater than 1 year in both groups.

In 6^{th} std control group the behavior score did not show any significant difference from baseline to 1 year. But it changed significantly from baseline to 2 years and from 1^{st} year to 2^{nd} year.

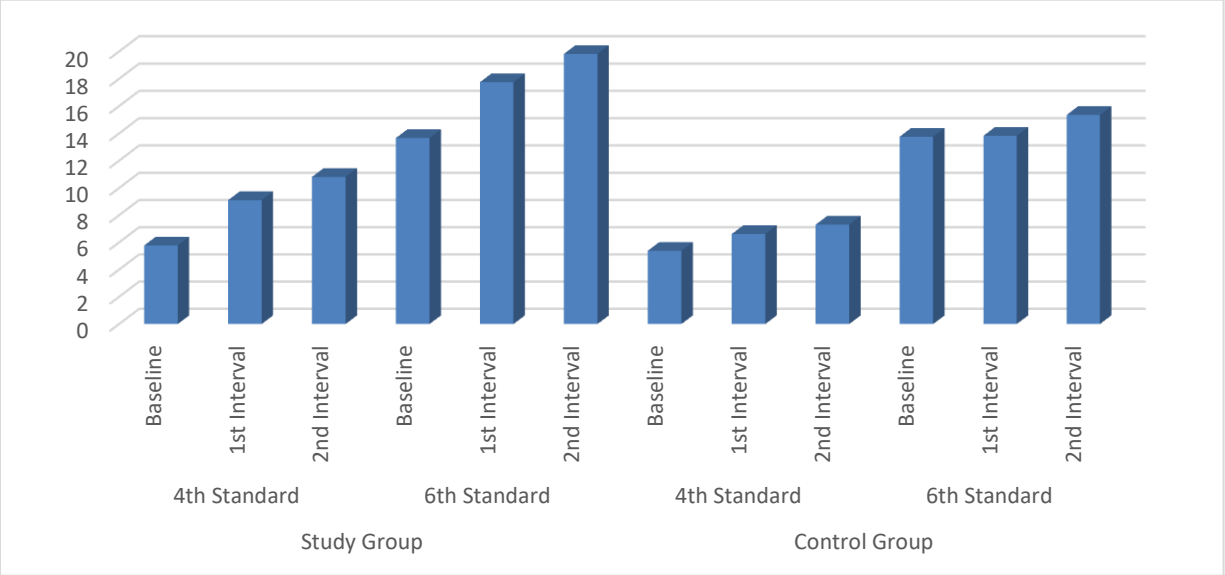


Table 7 – Within group comparison of DMFT in study and control group in 4th& 6th standards at different intervals of baseline, 1 year & 2 years.

Group	Std	Interval	Mean	SD	N	F	p value	Post hoc Comparison	p value
Study Group	4	0	1.51	.863	171	618.7	**0.001**	0 vs 1	**0.001**
		1	1.60	.955				0 vs 2	
		2	1.77	.826				1 vs 2	
	6	0	1.34	.949	185	408.4	**0.001**	0 vs 1	**0.001**
		1	1.44	1.026				0 vs 2	
		2	1.55	.994				1 vs 2	
Control Group	4	0	1.23	.688	197	628.4	**0.001**	0 vs 1	**0.001**
		1	1.23	.688				0 vs 2	
		2	1.23	.688				1 vs 2	
	6	0	1.82	1.134	170	436.7	**0.001**	0 vs 1	0.667
		1	1.82	1.134				0 vs 2	**0.001**
		2	1.82	1.134				1 vs 2	**0.001**

Intervals: 0 - Baseline; **1** – 1 year; **2** – 2 year; Statistically significant with p value ≤ 0.05

Within group comparison at different intervals using repeated measure ANOVA test showed overall statistically significant difference in DMFT scores for both study and control group of 4th & 6th std. Pairwise comparison in both study and control group of 4th std and study group of 6th std revealed statistically significantly higher practice scores at 1 year and 2 year compared to baseline. DMFT scores at 2 years is significantly greater than 1 year in both groups.

In 6th std control group the DMFT score did not show any significant difference from baseline to 1 year. But it changed significantly from baseline to 2 years and from 1st year to 2nd year.

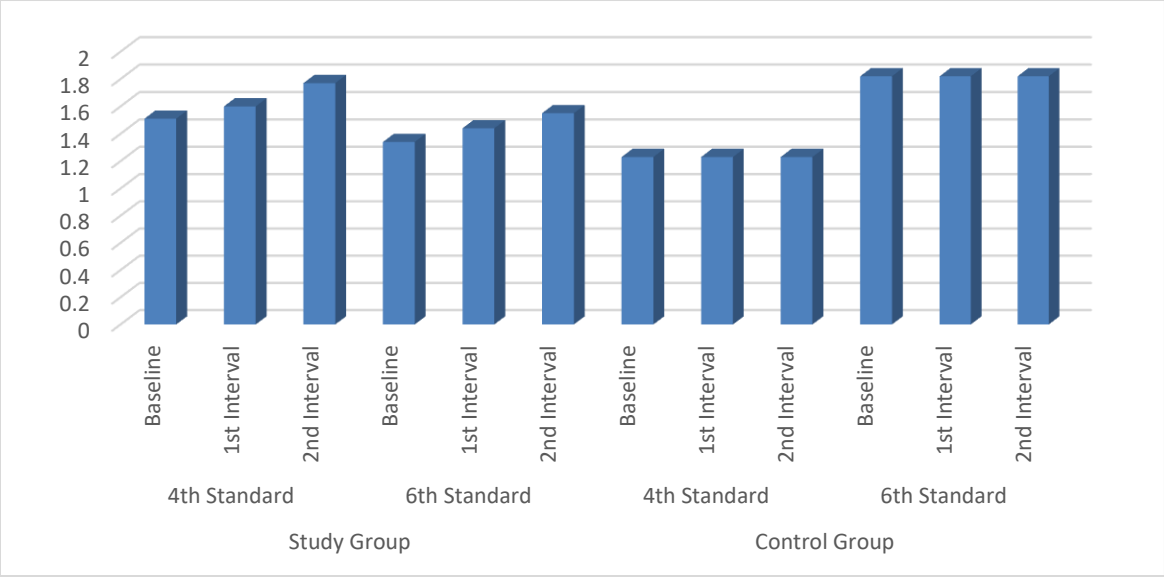


Table 8 – Within group comparison of OHI-S in study and control group in 4th& 6th standards at different intervals of baseline, 1 year & 2 years.

Group	Std	Interval	Mean	SD	N	F	p value	Post hoc Comparison	p value
Study Group	4	0	2.90	1.199	171	1004.6	**0.001**	0 vs 1	**0.001**
		1	2.52	1.019				0 vs 2	
		2	1.69	.8830				1 vs 2	
	6	0	2.92	1.118	185	1243.3	**0.001**	0 vs 1	**0.001**
		1	2.46	.9424				0 vs 2	
		2	1.56	.7434				1 vs 2	
Control Group	4	0	2.91	1.141	197	1260.2	**0.001**	0 vs 1	**0.001**
		1	2.53	.9922				0 vs 2	

		2	1.65	.8458				1 vs 2	
	6	0	2.94	1.080	170	1229.4	**0.001**	0 vs 1	**0.001**
		1	2.48	.9250				0 vs 2	
		2	1.57	.7210				1 vs 2	

Intervals: 0 - Baseline; **1** – 1 year; **2** – 2 year; Statistically significant with p value ≤ 0.05

Statistically significant difference in OHI-S scores were observed when compared within group at different time intervals for both study and control group. Pairwise comparison in both study and control group revealed statistically significantly higher OHI-S scores at 1 year and 2 year compared to baseline. OHI-S scores at 2 years is significantly greater than 1 year in both groups.

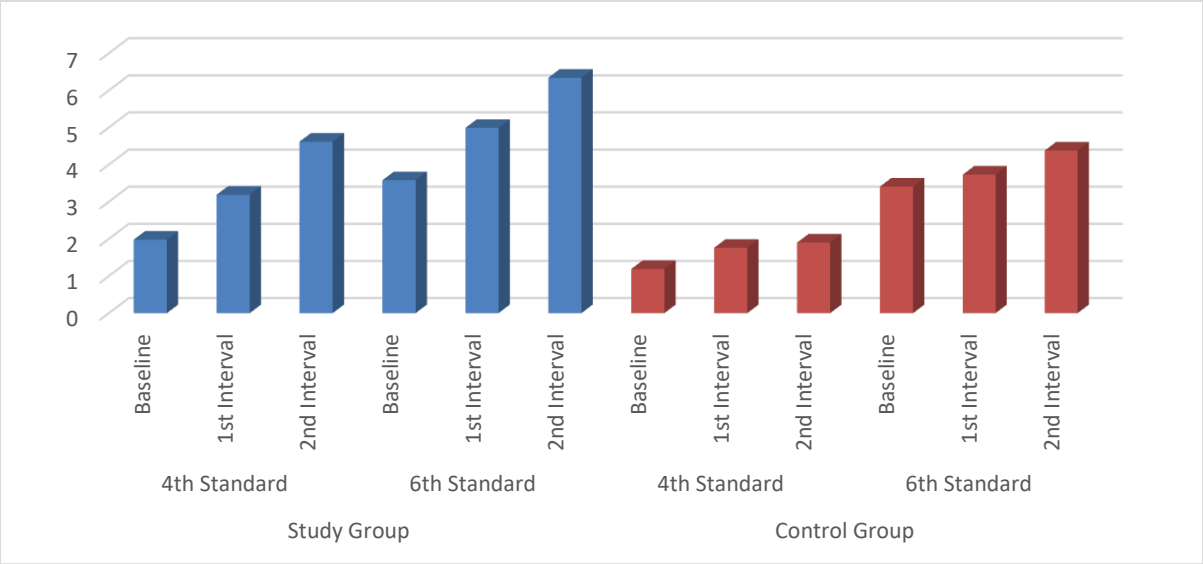
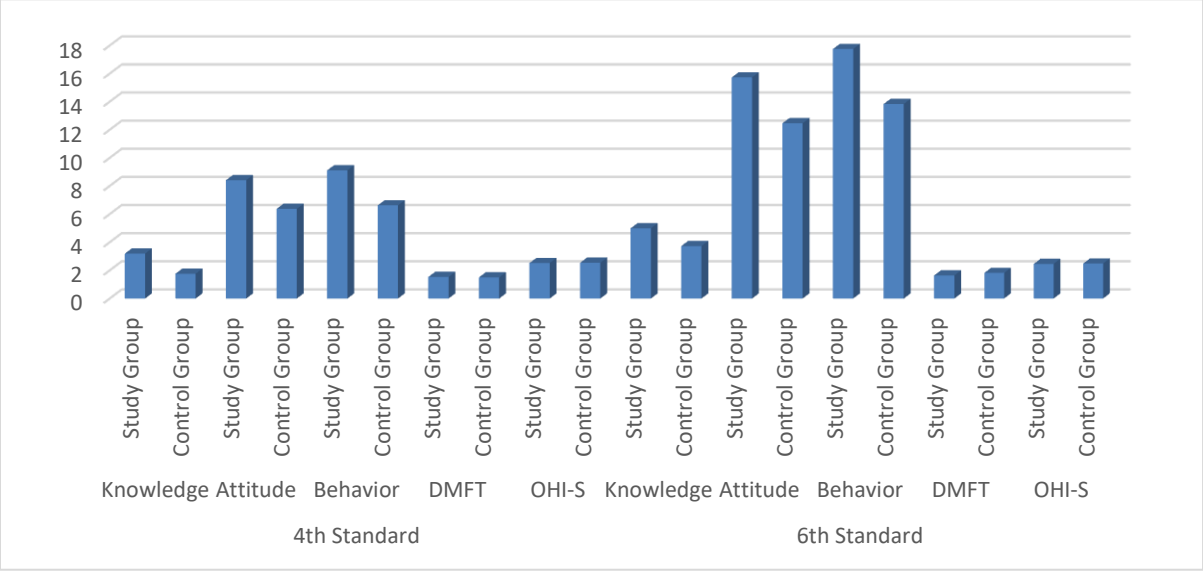


Table 9 – Between the groups comparison of study outcomes at 1 year in 4th& 6th standards

Standard		Group	N	Mean	SD	p value
4	Knowledge	Study Group	171	3.19	.821	**0.001***
		Control Group	197	1.76	.882	
	Attitude	Study Group	171	8.41	2.256	**0.001***
		Control Group	197	6.37	2.332	
	Behavior	Study Group	171	9.11	2.261	**0.001***

		Control Group	197	6.62	2.416	
	DMFT	Study Group	171	1.53	.955	0.83
		Control Group	197	1.50	.688	
	OHI-S	Study Group	171	2.5205	1.01945	0.86
		Control Group	197	2.5381	.99223	
6	Knowledge	Study Group	185	4.99	1.574	**0.001***
		Control Group	170	3.73	1.605	
	Attitude	Study Group	185	15.73	3.121	**0.001***
		Control Group	170	12.46	2.833	
	Behavior	Study Group	185	17.75	2.505	**0.001***
		Control Group	170	13.83	3.278	
	DMFT	Study Group	185	1.64	1.026	0.64
		Control Group	170	1.82	1.134	
	OHI-S	Study Group	185	2.4605	.94242	0.80
		Control Group	170	2.4847	.92500	

Unpaired t test; * Statistically significant with p value ≤ 0.05



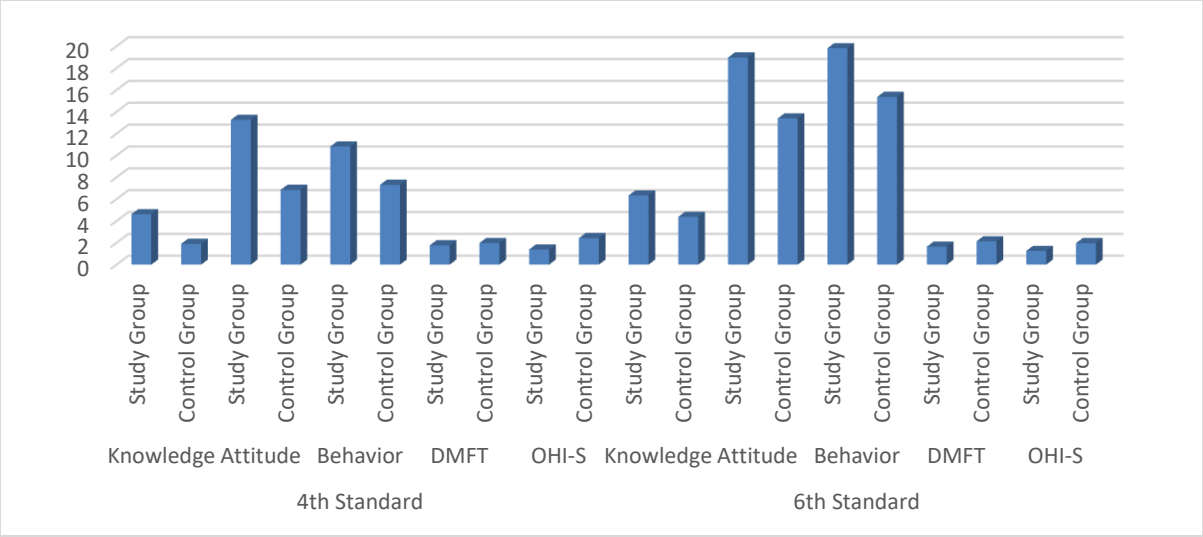
At 1 year, oral health knowledge, attitude and practice of study group showed statistically significantly higher scores compared to control group. However, no statistically significant difference was observed in DMFT scores and OHI-S scores between the groups in 4th and 6thstandard..

Table 10– Between the groups comparison of study outcomes at 2 years in 4th& 6th standards

Standard		Group	N	Mean	SD	P value
4	Knowledge	Study Group	171	4.62	.487	**0.001***
		Control Group	197	1.90	.956	
	Attitude	Study Group	171	13.26	1.611	**0.001***

		Control Group	197	6.85	2.614	
	Behavior	Study Group	171	10.82	.978	**0.001***
		Control Group	197	7.31	1.601	
	DMFT	Study Group	171	1.77	.826	**0.001***
		Control Group	197	1.98	.688	
	OHI-S	Study Group	171	1.39	.88309	**0.05***
		Control Group	197	2.43	.84580	
6	Knowledge	Study Group	185	6.34	.664	**0.001***
		Control Group	170	4.38	1.186	
	Attitude	Study Group	185	18.97	2.048	**0.001***
		Control Group	170	13.39	2.634	
	Behavior	Study Group	185	19.82	1.420	**0.001***
		Control Group	170	15.36	2.400	
	DMFT	Study Group	185	1.65	.994	**0.01***
		Control Group	170	2.14	1.134	
	OHI-S	Study Group	185	1.26	.74347	**0.05***
		Control Group	170	1.97	.72101	

Unpaired t test; * Statistically significant with p value ≤ 0.05



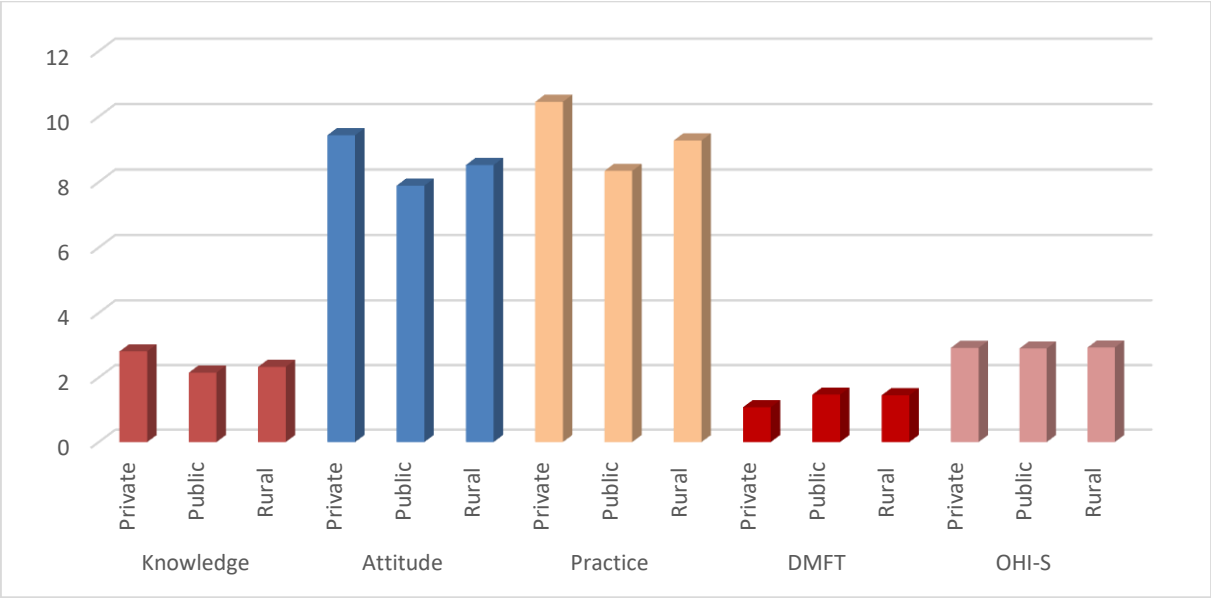
At 2 years, oral health knowledge, attitude and practice of study group showed statistically significantly higher scores compared to control group. Significantly differences were also seen in DMFT and OHI-S scores when control group was compared with the study group of both 4th& 6th standard students.

Table 11: Comparison of study variables among different school children at baseline

Variables	School category	Mean	SD	F value	p value	Post hoc comparison		Mean difference	p value
Knowledge	Private	2.81	1.7	10.159	**.001**	Pr	Pu	0.656	**0.001**
	Public	2.15	1.8				Ru	0.476	**0.011**
	Rural	2.33	1.6			Pu	Ru	-0.179	0.587
Attitude	Private	9.43	4.2	8.957	**.001**	Pr	Pu	10.53	**0.001**
	Public	7.89	4.2				Ru	0.912	**0.058**
	Rural	8.52	4.3			Pu	Ru	-0.624	0.331
Behavior	Private	10.45	4.5	12.365	**.001**	Pr	Pu	20.11	**0.001**
	Public	8.34	5.2				Ru	10.18	**0.029**
	Rural	9.27	5.2			Pu	Ru	-0.93	0.163
DMFT	Private	1.08	1.0	12.592	**.001**	Pr	Pu	-0.38	**0.001**
	Public	1.47	0.9				Ru	-0.36	**0.001**
	Rural	1.45	0.9			Pu	Ru	0.014	0.990
OHI-S	Private	2.92	1.1	.045	.956	Pr	Pu	0.025	0.965
	Public	2.90	1.1				Ru	-0.006	0.998
	Rural	2.93	1.1			Pu	Ru	-0.03	0.960

ANOVA Test. Statistically significant with p value ≤ 0.05

Pr – Private, Pu – Public, Ru – Rural.



ANOVA test revealed a statistically significant difference in the scores of knowledge, attitude and practice towards oral hygiene among the children of three schools. Statistically significant difference was observed in DMFT scores when compared the children of three schools. No difference was seen in OHI-S scores. Private school children had significantly more positive knowledge, attitude and practice compared to public school and rural school children. No difference in scores of knowledge, attitude and practice was observed between children of public school and rural school. Private children had significantly lower DMFT scores compared to public school and rural school children. However, no significant difference in DMFT scores was observed between public school and rural school children.

Table 12: Comparison of study variables among different school children at 1 year

			N	Mean	SD	F value	p value
Study Group	Knowledge	Private	168	4.32	1.621	2.567	.078
		Public	104	3.98	1.595		
		Rural	84	3.92	1.319		
	Attitude	Private	168	12.48	4.574	.668	.514
		Public	104	11.83	4.712		
		Rural	84	12.15	4.406		
	Behavior	Private	168	14.08	4.366	1.542	.215
		Public	104	13.14	5.640		
		Rural	84	13.19	5.048		
	DMFT	Private	168	1.24	1.069	12.781	**.001**
		Public	104	1.77	.850		
		Rural	84	1.75	.863		
	OHI-S	Private	168	2.49	.974	.072	.930
		Public	104	2.46	.97		
		Rural	84	2.51	1.00		
Control Group	Knowledge	Private	179	3.22	1.482	24.986	**.001**
		Public	104	1.97	1.444		
		Rural	84	2.36	1.640		
	Attitude	Private	179	10.53	3.615	23.627	**.001**
		Public	104	7.47	3.660		
		Rural	84	8.49	4.161		
	Behavior	Private	179	11.54	4.064	25.623	**.001**
		Public	104	7.87	4.376		
		Rural	84	9.19	4.710		
	DMFT	Private	179	1.46	.984	.359	.04
		Public	104	1.51	.935		
		Rural	84	2.51	0.96		
	OHI-S	Private	179	2.50	.95	.003	.035

		Public	104	2.51	.98		
		Rural	84	2.51	.94		

ANOVA Test. Statistically significant with p value ≤ 0.05

At the end of 1 year DMFT score in the study group showed significant difference in children of different schools. However, in control group all the variables showed significant difference between the children of different schools.

Table 13:Comparison of study variables among different school children at 2 years

			N	Mean	SD	F value	p value
Study Group	Knowledge	Private	168	5.58	.994	.733	.481
		Public	104	5.48	1.140		
		Rural	84	5.42	.996		
	Attitude	Private	168	16.70	3.093	3.814	0.2
		Public	104	16.06	3.919		
		Rural	84	15.49	3.179		
	Behavior	Private	168	15.59	4.510	.104	.901
		Public	104	15.33	4.810		
		Rural	84	15.54	4.838		
	DMFT	Private	168	1.40	.980	13.05	**.001**
		Public	104	1.89	.799		
		Rural	84	1.87	.818		
	OHI-S	Private	168	1.63	.832	.077	.926
		Public	104	1.60	.778		
		Rural	84	1.63	.83		
Control Group	Knowledge	Private	179	3.64	1.388	30.291	**.001**
		Public	104	2.22	1.595		
		Rural	84	2.81	1.668		
	Attitude	Private	179	11.37	3.633	27.374	**.001**
		Public	104	7.93	3.925		
		Rural	84	9.12	4.454		
	Behavior	Private	179	12.06	4.156	12.207	**.001**
		Public	104	9.41	4.352		
		Rural	84	10.87	4.781		

	DMFT	Private	179	1.46	.984	.359	**.05**
		Public	104	1.51	.935		
		Rural	84	1.50	.966		
	OHI-S	Private	179	1.617877	.7751143	.034	**.045**
		Public	104	1.636538	.8247456		
		Rural	84	1.607143	.7890494		

ANOVA Test. Statistically significant with p value ≤ 0.05

At the end of 2 year DMFT score in the study group showed significant difference in children of different schools. However, in control group all the variables showed significant difference between the children of different schools.

Table 14 – Analysis of treatment received by the sample.

Interval	**Filled teeth N (%)**
Baseline	61 (8.4%)
1 Year	137 (18.9%)
2 year	251 (34.7%)

At baseline 8.4% subjects had filled teeth. It increased to 18.9% at the 1st year examination and to 34.7% at the 2nd year examination.

Discussion –

Oral health is an essential component of general health which enables in speaking, eating, and socializing without experiencing active disease, discomfort or embarrassment[18]. Oral Health Education (OHE) is an important approach in changing individual behavior for the better oral hygiene and health. OHE not only influences oral health related practices and behavior in a favorable way, but also improves clinical parameters of oral health such as oral hygiene, gingival health and dental caries[18]. OHE is not just reduces disease and injury to the teeth but also has influence on general health and promotes a feeling of well – being.

The most common diseases in dentistry are preventable or easily controlled using simple procedures such as tooth brushing, controlling the frequency of sugar consumption, appropriate use of fluoride and periodic visits to the dentist. But good oral health has not yet reached the population at large[19]. Among the many different approaches to the prevention of dental diseases, the most cost-effective method is health education[20]. Educational and motivational programs in oral health have been implemented so that most of the population can have access to information related to problems in the oral cavity and guidelines for hygiene, as well as motivation to pay special attention to oral health[21]. The adoption of good oral health habits in childhood often leads to positive results in the quality of the health and life of the children.

Thus this study aimed to compare the effect of Oral Health Education given after developing a dental health information material primarily adopted and developed according to the WHO Health Promoting Schools guidelines (HPS) in the study group vs the control group. The parameters established for the same were the change in knowledge, attitude & behavior along with the dental caries and the oral hygiene status over a follow up period of 2 years.

Our study was conducted in a school setting. Schools are the ideal place for oral health promotion because approximately one billion children worldwide spend most of their daytime life there[18]. The school years cover a period that runs from childhood to adolescence. These are influential stages in people's lives when lifelong sustainable oral health related behaviors, as well as beliefs and attitudes, are being developed. Children are particularly receptive during this period and the earlier the habits are established, the longer lasting the impact[22]. Moreover, the messages can be reinforced regularly throughout the school years. Providing education on oral health in schools helps children to develop personal skills, provides knowledge about oral health and promotes positive attitudes and healthy behavior. Oral health education can be taught as a specific subject or as part of other subjects, addressing the underlying physical, psychological, cultural and social determinants of oral and general health. Integrated approaches with active participation promote sustainable changes in behavior. Oral health issues can be incorporated effectively into the curriculum. At schools, OHE can be combined with preventive services to achieve oral health promotion. Compared to community based approach, school based approach has been reported to be more efficient in delivering preventive and curative services[23]. Children may also be equipped with personal skills that enable them to make healthy decisions, to adopt a healthy lifestyle. It was suggested that sooner the oral health related behavior were initiated in

life, higher was the probability for successful long – term maintenance. High oral health morbidity and poor oral hygiene was observed due to lack of health education and insufficient preventive measures[24]. Adolescents who are suffering from poor oral health were 12 times more likely to restrict-activity days compared to those are in good oral health[25, 26]. More than 50 million school hours are lost globally because of poor oral health. This can affect student's class room performance and success later in life [27- 29].

Studies conducted in China[30] & Denmark[31] also have used similar classroom settings with the help of flipcharts with the involvement of parents and training workshops for teachers. Given the time duration of our study and design involvement of parents was not feasible in our study. The results of this OHE intervention were found to be effective in increasing school children's knowledge; attitude; and behavior scores toward oral health.

The sampling technique followed for the study was Cluster randomized controlled trial. Though the schools from various groups of private, public and rural were selected according to the list, geographical areas and permissions obtained, all the students of 4^{th} & 6^{th} standard were selected as a cluster of the entire school and then randomly allocated in study and control groups. It was assumed going by previous studies[32, 33] that both the study and control groups were similar and no comparisons were made at baseline.

In this study one-time a year OHE (Control group) resulted in a significant improvement in oral health knowledge, attitude and behavior of school children but failed to produce a statistically significant improvement in DMFT scores. However, when OHE was rendered 4 times annually for two years (Study group) it showed a statistically significant improvement in oral health

Knowledge, Attitude and Behavior, DMFT and OHI-S scores at the end of 2 years. The changes observed on the figures of the DMFT and OHI-S might express an important improvement in the children's and adolescents' skills to control dental plaque accumulation, one of the essential biological factors associated with the development of the most prevalent oral diseases. Similar findings were observed in previous dental literature[34, 35].

Study showed that Single-lecture technique appears to be inadequate because after 1 year the difference in the proportion of correct responses to the questionnaire reverted back to pre-intervention levels[36].

At the end of 2 years, study group in which repetitive OHE was delivered showed significant improvement in the oral health knowledge, attitude and practice, OHI-S scores and DMFT scores than control group. Similar findings were observed in other studies[37- 39]. Repetition and reinforcement have been shown to play a crucial role in the sustainability of health behavior[40]. They increase the likelihood that a newly learned behavior will be repeated in future[41, 42]. Literature reviews of oral health education suggest that especially single session OHE programs can have only short term gain in oral health behavior and oral health status[43- 48]. Long term educational programs are comparatively more effective than the ones based on short term interventions[49]. OHE bring changes in knowledge, attitudes and behavior of the participants. However, different children are ready for the change at different times[50]. Similar to our study results other studies also revealed that OHE programs incorporating repetition have generally been shown to be effective[51- 54].

This study also compared the knowledge, attitude and behavior of children of private school, public school and rural school. The study showed that knowledge, attitude and behavior towards oral health of private school children was better than public school and rural school children. And also private school children had significantly low DMFT scores compared children of other schools. Similar results were observed in the previous studies[55- 57]. Our study showed significant difference in knowledge attitude and practice at both 1 year and 2 years in control group but no such significant difference was observed in study group. This finding again validates that repeated intervention of health education not only improves oral health knowledge attitude and practice among children but also decreases oral health inequality among the school children of private schools, public schools and rural schools. Studies have revealed that private school children engage in good oral hygiene practices and utilize more dental care compared to others[58]. Oral health is influenced by several factors like social, economic and environmental factors which play a vital role in shaping positive oral health behavior[59]. Several researches have revealed that oral health of private school children is better than public school and rural school because of following reasons: Private school children belong to higher socioeconomic status; more affordability; parents' attitude; dental awareness and better social support[55, 60].

Similar to this study another research showed a statistically significant difference in DMFT scores between the private and government schools[58]. The prevalence of dental caries among 12 years old children from private schools and government schools was 32.8% and 70.3% respectively. Poor oral health of public and rural school children may be attributed to lack of awareness, affordability, or underutilization of dental care facilities by the children in the

government schools. The results of our study were consistent with the findings of this study and others[61, 62].

Schools are the important platforms for shaping and inculcating positive oral health behavior among the children at tender age. Behavior learned at younger age lasts long and directly influence one's oral health behavior. Promoting oral health of children is the shared responsibility of health administrators, school teachers and administrator and parental commitment. Strategies like WHO oral health promoting schools; training teachers about oral health promotion and engaging parents in shaping children's behavior could bring down such differences in oral health of children in private and public schools. The more repetitive the OHE the better is the impact. Our study could study the impact of this OHE over a period of 2 years and showed significant improvement in the knowledge, attitude and behavior along with the DMFT and OHI-S scores. Thus if repetition and reinforcement of OHE be included in the curriculum of schools in different standards it may definitely help in improving the parameters of oral health. Our study not only benefitted the children by inculcating a positive knowledge, attitude, behavior and improved oral hygiene status but could meet the dental needs of almost 26% of the children who being encouraged and motivated, received dental treatment. Due to conscious efforts on the part of the investigators the attrition rate was successfully controlled to 4.7%.

Improving the knowledge, attitude and behavior of young children by exposing them to repetitive OHE may be possible up to a certain extent but the results may be more profound

when other stake holders including the teachers and parents are involved I the process. Moreover making healthy decisions and adopting a healthy lifestyle for maintaining and improving oral health without the positive support of parents may not be entirely possible for young dependent children given the socioeconomic concerns and the awareness issues especially in rural areas of developing countries like India and poor inhabitants of cities who send their children to public and rural schools. These aspects of Oral health are emphasized by other studies. Given the time duration of our study and design involvement of parents was not feasible which may be a limitation of our study.

The DMFT index is one of the simplest and most commonly used indices and universally accepted in for assessing dental caries prevalence as well as dental treatment needs among populations. It quantifies dental health status based on the number of carious, missing and filled teeth. It has also been the index of choice in the WHO Global Oral Health Data Bank. With more sensitive indices like DMFS and ICDAS being available use of DMFT in our study can be considered to one of the limitations of our study to a certain extent. Further studies can be done by using more sensitive indices.

The study sample in our study was in mixed dentition period. So use of a dental caries index for deciduous teeth too may have been appropriate in this population. But given the age range of 10-14 years for this follow up study, teeth which would have physiologically exfoliated over a 2 year period would have been difficult to evaluate. So the deciduous dentitions were not recorded for dental caries.

Conclusion –

Oral health education is effective in improving the knowledge attitude and practice regarding oral health and in reducing the oral deposits and caries increment.

This study also validates the finding of previous research revealing significant difference in knowledge, attitude and behavior towards oral health of Private, Public and Rural school children.

Results of this study evidently proved that incorporating oral health education in school curriculum will significantly improve the oral health of the children. Repetitive Oral Health education also plays a positive role in improving of oral health knowledge, attitude and behavior in children.

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Annexure –

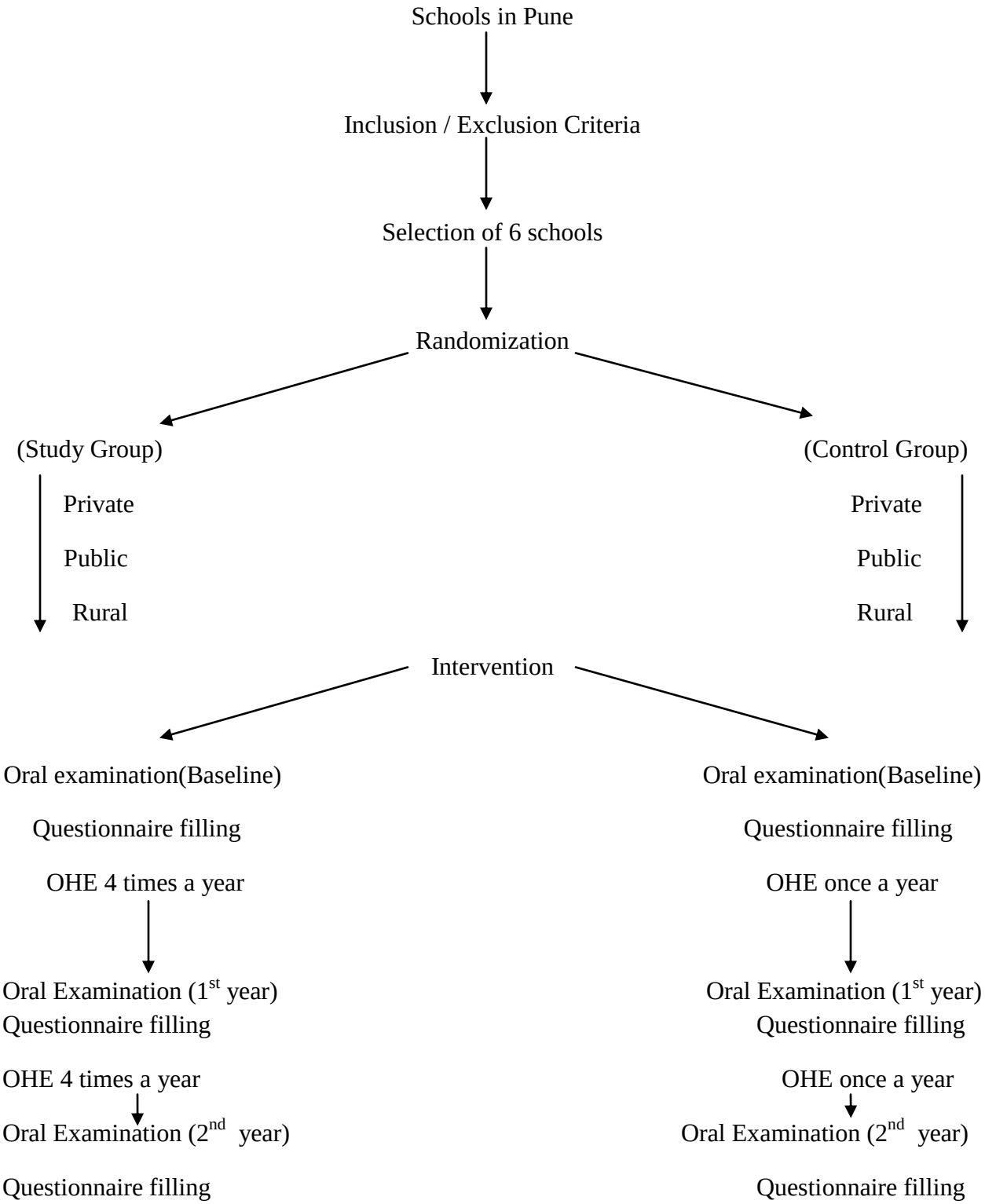
ANNEXURE I

Time Schedule

Jan 2014	Obtaining the list of schools
Feb 2014	Obtaining the permissions from the schools
March 2014	Selection of 12 schools from Private, Public & Rural schools
June- July 2014	Baseline data collected. Questionnaire filling & Oral Examination Oral Health Education in Study and control group
Sept -Oct 2014	Oral Health Education in Study Group
Dec 2014 -Jan 2015	Oral Health Education in Study Group
Mar – Apr 2015	Oral Health Education in Study Group
June- July 2015	End of 1st year data collected. Questionnaire filling & Oral Examination Oral Health Education in Study and control group
Sept -Oct 2015	Oral Health Education in Study Group
Dec 2015 -Jan 2016	Oral Health Education in Study Group
Mar – Apr 2016	Oral Health Education in Study Group
June- July 2016	End of 2nd year data collected. Questionnaire filling & Oral Examination.

ANNEXURE II

Flow Chart of Methodology



ANNEXURE III

Principal Investigator : Dr Amol Jamkhande

Guide : Dr. J.S. Bhawalkar

Research Institute : Dr. D.Y.Patil University (DPU)

Contact details : 9850286360

PARTICIPANTS INFORMATION SHEET/INFORMED CONSENT FORM

A. Information to Participant

You are invited to take part in research study titled **"Evaluating change in oral health after integrating dental information in the school and meeting dental needs of 4th and 6th standard students".**

This document provides you with all necessary information about the study. Please read this document carefully. Make sure that you understand your wards participation would involve in it. In case you have questions kindly contact us, before you sign this document.

1. Introduction

Schools provide an important setting because they reach the children worldwide and through them they reach the school staff, families and community at large. According to the WHO health promoting school framework, oral health education should be a part of all subjects in the school curriculum. It can be effectively incorporated in the school curriculum. Integrated approaches with active participation promote sustainable changes in the behavior. Health promoting school concept of WHO is seldom implemented in Indian context. This study is aimed to design the contents of dental information to be integrated in the school and to evaluate the change in oral health following this intervention after a period of 2 years.

2. Purpose

This study is thus perceived to:

- To evaluate the change in oral health after integrating dental information in the school and meeting dental needs of 4th and 6th standard students from Pune.

3. Procedure

If you agree to participate in the study, you will be given a dental information book, health education and you will need to answer a written exam based on the information given in the dental booklet and undergo an oral cavity clinical

examination. The oral examination is harmless and painless.

4.	Duration	This research runs for 2 years.
5.	Number of sites.	This study is carried out in schools of Pune only. .
6.	Benefit/ Risk	There are no direct risks or benefits to you but the study would be useful in improve the dental health status of the children and increase their awareness.
7.	Compensation	There is no compensation for participation in this study.
8.	Queries/Question	You are most welcome to ask any question at any time about the study
9.	Voluntary status	We want you to know that your wards participation is entirely voluntary. You are free to refuse to take part or discontinue from the study at any time.
10.	Confidential statement/ Publication issue	Your wards participation in the study will be maintained as confidential information. Your name and details will not be disclosed. The completed proforma will be analyzed and the positive or negative results may be published in any Indian/ International Journal, without revealing the identifying details about your site.

B. Participant Consent Form

I (Shri/Smt _____) have read and understood the above participant information and informed consent form thoroughly. I understand that my (or my ward(s)) participation in the study is voluntary and that I (or my ward(s)) am free to withdraw at any time. I voluntarily give my (or my ward(s)) consent to participate in above said study

Parent/ Teacher Name/: _____Signature: _____ Date & Time: _____

Participant Name _____

Investigator Name: _____ Signature: _____ Date & Time: _____

ANNEXURE V - Questionnaire

6th Standard

KNOWLEDGE –

1. Which food items will cause harm to your teeth the most?
   a. Junk food
   b. Sticky sweet food
   c. Cold drink & juices
   d. Don't know
2. What do you mean by tooth decay?
   a. Having germs in teeth
   b. Tooth starts shaking
   c. Destruction & hole in the tooth
   d. Don't know
3. What causes tooth decay?
   a. Brushing once a day
   b. Acids formed by bacteria
   c. By not visiting the dentist
   d. Don't know
4. How many times should you brush your teeth?
   a. Once a day
   b. Twice a day
   c. Never
   d. Don't know
5. How can we prevent gum problems?
   a. By eating soft food
   b. By eating hard food
   c. By brushing with a toothbrush & toothpaste
   d. Don't know
6. How should we clean our teeth & gums to keep them healthy?
   a. Mishri
   b. Tooth powder
   c. Toothbrush & fluoride containing toothpaste
   d. Don't know
7. To whom should we go to check and treat our teeth?
   a. Family doctor
   b. Children specialist doctor
   c. Dentist
   d. Don't know

ATTITUDE –

	How much important is it for you that -	Totally unimportant	Slightly unimportant	Slightly important	Very important
1	Your mouth is free from bad breadth and bacteria				
2	You should eat sweets less frequently				
3	You should look good due to healthy teeth & gums				
4	You should use the right things to clean your teeth on advice of a dentist				
5	You should take care of your teeth & gums so that they remain healthy				
6	You should brush your teeth twice and rinse after eating anything				
7	You visit the dentist for a regular ck up				

BEHAVIOR –

1	Type of toothpaste used now	**Containing fluoride**	Without fluoride	Don't know	Not using toothpaste
2	Eating between meals	Once a day	2-4 times a day	More than 4 times a day	**Sometimes / never**
3	How many times do you eat sweets/ chocolates	More than 5 times a day	1-3 times a day	**Sometimes / never**	4-5 times a day
4	How many times do you brush your teeth	Once a day	Twice a day	**Everytime after meals**	Don't brush your teeth
5	When do you go to a dentist for a dental check up	**Regularly**	Sometimes	After having problem in teeth	Never
6	When did you last visit the dentist?	**Less than 6 months**	In 4^{th} or 5^{th} std	Before 4^{th} std	Never
7	How did you learn to brush your teeth	On your own	From parents	**From dentist**	From teacher

4th Standard

KNOWLEDGE –

1. Which food items will cause harm to your teeth the most?
   a. Junk food
   b. Sticky sweet food
   c. Cold drink & juices
   d. Don't know
2. What do you mean by tooth decay?
   a. Having germs in teeth
   b. Tooth starts shaking
   c. Destruction & hole in the tooth
   d. Don't know
3. How many times should you brush your teeth?
   a. Once a day
   b. Twice a day
   c. Never
   d. Don't know
4. How should we clean our teeth & gums to keep them healthy?
   a. Mishri
   b. Tooth powder
   c. Toothbrush & fluoride containing toothpaste
   d. Don't know
5. To whom should we go to check and treat our teeth?
   a. Family doctor
   b. Children specialist doctor
   c. Dentist
   d. Don't know

ATTITUDE –

	How much important is it for you that -	Totally unimportant	Slightly unimportant	Slightly important	Very important
1	Your mouth should be free from bad breadth and bacteria				
2	You should eat sweets less number of times				
3	You should look good due to healthy teeth & gums				
4	You should take care of your teeth & gums so that they remain healthy				
5	You should brush your teeth twice and rinse after eating anything				

BEHAVIOR –

1	Eating between meals	Once a day	2-4 times a day	More than 4 times a day	**Sometimes / never**
2	How many times do you eat sweets/ chocolates	More than 5 times a day	1-3 times a day	**Sometimes / never**	4-5 times a day
3	How many times do you brush your teeth	Once a day	Twice a day	**Everytime after meals**	Don't brush your teeth
4	How did you learn to brush your teeth	On your own	From parents	**From dentist**	From teacher

ANNEXURE VI

ASSENT FORM

Evaluating change in oral health after integrating dental information in the school and meeting dental needs of 4th& 6th standard students. A two year follow up study.

My name is Dr.Amol Jamkhande and I am a dentist by profession. I am trying to learn about the how much you know about teeth and its surrounding structures in the mouth.

I am also going to teach you more about your teeth and how to take care of them.

If you agree, you will be asked to answer few questions and I will check your teeth for germs and bacteria.

If you agree to help us, you should know that your teachers and classmates won't know what you have answered to the questions nor they will be knowing about your teeth condition. You should also know that if you decide to help us or if you decide to say "no," your choice will not affect your marks.

Please talk this over with your parents before you decide if you want to be in my group or not. I will also ask your parents/ teacher to give their permission for you to be in the group, but even if your parents say "yes," you can still say "no" and decide not to be in the group.

Remember, being in the group is up to you and no one will be upset if you don't want to be in the group or if you decide to stop after we begin, that's okay, too.

You can ask any questions that you have about this. If you have a question later that you didn't think of now, you can ask me or ask your parents/ teachers, to call me at: [**9823185830**].

If you think you want to be a part of our group than u can sign on the line below by writing your name.

_____

ANNEXURE VII

Photograph 1 – Armamentarium used

Photograph 2 – Oral Health Education in Progress